

### **REMARKS**

Claims 1-6, 9, 11-14, 16-33, 35-38, 40-42 and 44 are pending in the present Application. Claim 19 has been canceled, claims 1, 20-29, 31, 42, and 44 have been amended, and leaving claims 1-6, 9, 11-14, 16-18, 20-33, 35-38, 40-42 and 44 for consideration upon entry of the present Amendment. No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

#### Claim Amendments

Claims 1, 42 and 44 have been amended to contain the subject matter of claim 19 and to further specify the ratio of resins according to paragraph [0037] of the Specification as originally filed.

Claims 20-29 and 31 have been amended such that they now depend from claim 1 instead of claim 19.

No new matter has been introduced by these amendments.

#### Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-3, 5-6, 11-14, 16-21, 27-30, 42 and 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Niwano et al. '142 ("Niwano") and Ohgo '671 ("Ohgo"), further in view of Daecher et al. '829 ("Daecher"), Inuoe '630 ("Inuoe") and Hashizume et al. WO 02/059173 ("Hashizume") [US 2004/0077795 is the English equivalent].

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, or knowledge generally available in the art at the time of the invention, must provide some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

"A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR Int'l*

*Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must “identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *Id.*

Independent claims 1, 42, and 44, as currently amended, are directed to data storage medium requiring, *inter alia*, 1) a poly(arylene ether) resin and poly(alkenyl aromatic) resin (PAE/PAA) substrate layer of a specified ratio in combination with a polycarbonate optical layer; and 2) exacting dimensions for the land and groove features of the PAE/PAA substrate layer along with a high level of percent replication of mold features. These claims have not been rendered obvious by the cited art for the following reasons. First, none of the cited references Niwano, Ohgo, Daecher, Inuoe and Hashizume, alone or combined, teaches or suggests a data medium comprising a PAE/PAA substrate in combination with a polycarbonate optical layer. Second, none of the references teaches or suggests a data storage medium comprising a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer, where the substrate exhibits a land and groove pitch of about 0.05 to about 0.35 micrometer and a land and groove replication of greater than or equal to about 90 percent required by instant independent claims 1, 42 and 44.

Additionally, the requirement for a determination of obviousness is that “both the suggestion and the expectation of success must be founded in the prior art, not in applicant’s disclosure”. *In re Dow Chem.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988).

An Examiner thus cannot base a determination of obviousness on what the skilled person in the art might try or find obvious to try. Rather, the proper test requires determining what the prior art would have led the skilled person to do, with a reasonable expectation of success.

Niwano is directed to optical disk substrates and lenses prepared by molding a resin composition comprising a polymer composed of aromatic vinyl monomer units and a polyphenylene ether. (Niwano, Abstract) Niwano does not teach any type of disk medium substrate combined with a polycarbonate optical layer, let alone a PAE/PAA substrate in combination with such an optical layer.

Ohgo is directed to a manufacturing method for an optical disc master. This reference does not disclose a substrate prepared from PAE/PAA, only acrylic resin or polycarbonate resin. (Ohgo, [0012]) Although a polycarbonate coating layer over a data layer is disclosed,

there is no mention of combining a polycarbonate layer with a substrate of different material (Ohgo, [0072]) Hence, without a suggestion and an expectation of success to use a polycarbonate optical layer with a PAE/PAA substrate, a proper showing for obvious cannot be found.

Daecher is directed to an apparatus to form a plastic sheet in a continuous fashion for optical and electronic display applications. (Daecher, Abstract) Optical storage media are disclosed where the substrate is particularly homopolymers and copolymers of polycarbonate, polystyrene, polyacrylic, polyester, polyolefin, polyacrylate, and mixtures thereof. (Daecher, Column 6, lines 7-11) The substrate can be coated with a protective layer of lacquer or resin. (Daecher, Column 6, lines 3-7) Although polyphenylene oxide and polystyrenes are disclosed in a long list of thermoplastic resins that can be formed into a plastic sheet using the Daecher apparatus (Column 14), nowhere does the reference teach a mixture of these resins as a data storage media substrate in combination with a polycarbonate optical layer. Hence, Daecher, combined with the teaching of the other two references, does not lead one of ordinary skill to expect success when using a PAE/PAA substrate in combination with a polycarbonate optical layer.

Inuoe generally discloses a “process for producing high-density thin type optical disk substrates having good replicability and birefringence sufficient for practical use. In filling the resin into the cavity, the stress on the resin is reduced by controlling the relation of the cavity width and the injection compression force to reduce birefringence. Further, the mirror surface of the mold is maintained at a certain temperature to facilitate the resin flow and a good replicability and reduction of birefringence is achieved by terminating the resin filling and starting the compression process at the time at which the pressure of the resin filling is at a minimum.” (Inuoe, Abstract) Polycarbonate is disclosed as the disk substrate and not PAE and/or PAA. Optical layers combined with the substrate layer do not seem to be disclosed in Inuoe. Again, Inuoe, combined with the teaching of the other references, does not lead one of ordinary skill to expect success when using a PAE/PAA substrate in combination with a polycarbonate optical layer.

Hashizume does not teach or suggest the use of PAE/PAA resin substrates in combination with a polycarbonate optical layer. Indeed, Hashizume teaches away from using

polycarbonate in any disk substrate for “its high birefringence and distortion of disks due to moisture absorption” especially in regards higher capacity recording disks (e.g., magneto-optical recording disks, digital versatile disks, and disks using blue laser optical equipment. (Hashizume, US 2004/0077795 [0003]) Indeed, the recognition that polycarbonate tends to distort under moist conditions would suggest to one of skill in the art to reconsider using a polycarbonate optical layer as it may exhibit poor dimensional stability under highly humid conditions. It is noted that claims 27-28, which ultimately depend from claim 1, require the data storage medium to meet a specified radial tilt change value after 96 hours at 80°C. Based on Hashizume, one of skill in the art would not expect success in minimizing radial tilt when polycarbonate is used. Accordingly, Hashizume in combination with the other cited references fail to render obvious claims 1-3, 5-6, 11-14, 16-18, 20-21, 27-30, 42 and 44 as none of the references teaches each and every element of the claims. Furthermore, the combined references fail to show an expectation of success to prepare a data storage medium comprising a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer. Reconsideration and removal of the rejection are respectfully requested.

Claims 1-6, 11-14, 16-21, 25, 27-31, 33, 35-38, 40-42 and 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Niwano and Ohgo, in view of Daecher, Inuo, and Hashizume, further in view of Saito et al. ‘261 (“Saito”).

Independent claims 1, 42 and 44 were previously discussed. Independent claims 33 and 38 also require, *inter alia*, 1) a PAE/PAA substrate layer of a specified ratio in combination with a polycarbonate optical layer; and 2) exacting dimensions for the land and groove features of the PAE/PAA substrate layer along with a high level of percent replication of mold features. It is also noted that claim 33 and claim 40, which is dependent upon claim 38, both require the data storage medium to meet a specified radial tilt change value after 96 hours at 80°C. Claims 33 and 38, along with their dependent claims, have not been rendered obvious according to the argument previously presented above. Furthermore, Saito fails to provide the requisite teaching/suggestion absent from Niwano, Ohgo, Daecher, Inuo, and Hashizume.



Saito generally discloses an optical recording medium including a substrate having successively disposed thereon a light-reflecting layer, a recording layer and a cover layer, with recording and playback being effected by irradiating the medium with a laser beam having a wavelength of 450 nm or less from the side disposed with the cover layer, wherein a sputter layer having a thickness of 1 to 80 nm is formed between the recording layer and the cover layer, and the sputter layer and the cover layer are adhered with an adhesive. (Saito, Abstract)

Saito does not teach or suggest a PAE/PAA substrate, let alone a data storage medium comprising a PAE/PAA substrate in combination with a polycarbonate optical layer. Although polycarbonate is taught as a resin for the substrate [0019] or a cover layer [0060], it is not suggested for use as an optical layer for a PAE/PAA substrate. (Saito). In view of the combined teachings of Saito, Niwano, Ohgo, Daecher, Inuoe, and especially Hashizume's teaching away from using polycarbonate in a recording disk, one of skill in the art would not expect success in using a polycarbonate optical layer in combination with a PAE/PAA substrate in a data storage medium. Accordingly, claims 1-6, 11-14, 16-18, 20-21, 25, 27-31, 33, 35-38, 40-42 and 44 have not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claims 1-6, 11-14, 16-31, 33, 35-38, 40-42 and 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Niwano and Ohgo, in view of Daecher, Hashizume, and Saito, further in view of (Ueda et al. JP2000-351891 ("Ueda") or Ito et al. EP 1178068 ("Ito")) combined with Ogawa et al. '313 ("Ogawa").

As discussed above, Niwano, Ohgo, Daecher, Hashizume, and Saito fail to render obvious independent claims 1, 33, 38, 42 and 44 or their dependent claims as the references fail to teach or suggest a data storage medium comprising 1) a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer; and 2) the PAE/PAA substrate having the exacting dimensions for the land and groove features of the PAE/PAA substrate layer along with a high level of percent replication of mold features. Further, the references fail to provide some suggestion or incentive that would have motivated a skilled artisan to modify or combined the references to result in a data storage medium having the combination of a PAE/PAA substrate layer in combination with a polycarbonate optical layer.

Ueda, Ito, and Ogawa also fail to provide the requisite teaching/suggestion absent from Niwano, Ohgo, Daecher, Inuo, Hashizume and Saito.

Ito generally discloses a method for producing a starting material for polycarbonate resin and for producing polycarbonate resin. (Ito, Abstract) Ito does not teach or suggest using a polycarbonate optical layer in combination with a PAE/PAA substrate to prepare a data storage medium.

Ueda generally discloses compounding polystyrene glycol with an aromatic polycarbonate resin for use as a substrate for high density optical disk. (Ueda, Abstract) Ueda does not teach or suggest using a polycarbonate optical layer in combination with a PAE/PAA substrate to prepare a data storage medium.

Ogawa generally discloses a polycarbonate resin for use in optical disks. (Ogawa, [0002]) Ogawa does not teach or suggest using a polycarbonate optical layer in combination with a PAE/PAA substrate to prepare a data storage medium.

In view of the combined teachings of the references and especially in view of Hashizume's teaching away from using polycarbonate in a recording disk, one of skill in the art would not expect success in using a polycarbonate optical layer in combination with a PAE/PAA substrate in a data storage medium. Accordingly, claims 1-6, 11-14, 16-18, 20-31, 33, 35-38, 40-42 and 44 have not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claims 1-6, 11-14, 16-33, 35-38, 40-42 and 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Niwano and Ohgo, in view of Saito, Hashizume, Daecher, Inuo, (Ueda or Ito) and Ogawa, further in view of Mino et al. '957 ("Mino") or Dris et al. WO 03/021588 ("Dris").

As discussed above, Niwano, Ohgo, Saito, Hashizume, Daecher, Inuo, Ueda, Ito, and Ogawa fail to render obvious independent claims 1, 33, 38, 42 and 44 or their dependent claims as the references fail to teach or suggest a data storage medium comprising 1) a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer; and 2) the PAE/PAA substrate having the exacting dimensions for the land and groove features of the PAE/PAA substrate layer along with a high level of percent replication of mold features.

Further, the references fail to provide some suggestion or incentive that would have motivated a skilled artisan to modify or combine the references to result in a data storage medium having the combination of a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer. Mino and Dris also fail to provide the requisite teaching/suggestion absent from the other references.

Mino generally discloses an optical recording medium containing a reflective film, a recording film and a protective film on a substrate and further an outer layer of a hard coat resin layer. (Mino, Abstract) An optical information recording medium having a polycarbonate substrate and a polycarbonate transparent sheet layer is disclosed. (Mino, [0110]) However, PAE/PAA substrates are not taught or suggested, let alone a data storage medium prepared from a PAE/PAA substrate and a polycarbonate optical layer.

Dris generally discloses a data storage medium, and in particular to a data storage medium comprising at least one high (Young's) modulus layer used to control the overall degree of flatness in the storage medium. (Dris, Abstract) The reference does not teach or suggest a data storage medium prepared from a substrate of a specified ratio of PAE/PAA and a polycarbonate optical layer as is required by the instant claims.

In view of the combined teachings of the references and especially in view of Hashizume's teaching away from using polycarbonate in a recording disk, one of skill in the art would not expect success in using a polycarbonate optical layer in combination with a PAE/PAA substrate of a specified ratio in a data storage medium. Accordingly, claims 1-6, 11-14, 16-18, 20-33, 35-38, 40-42 and 44 have not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claims 1-6, 11-14, 16-21, 27-30, 42 and 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Feist et al. '455 ("Feist"), Daecher, Inuoe, and Ohgo.

As discussed above, Daecher, Inuoe, and Ohgo fail to render obvious independent claims 1, 33, 38, 42 and 44 or their dependent claims as the references fail to teach or suggest a data storage medium comprising 1) a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer; and 2) the PAE/PAA substrate having the exacting dimensions for the land and groove features of the PAE/PAA substrate layer along with a high

level of percent replication of mold features. Further, the references fail to provide some suggestion or incentive that would have motivated a skilled artisan to modify or combine the references to result in a data storage medium having the combination of a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer. Feist also fail to provide the requisite teaching/suggestion absent from the other references.

Feist generally discloses poly(arylene ether) data storage media. (Feist, Abstract) Disclosed protective layers include polyacrylate or polycarbonate. (Feist, [0040]) Although optical layers are disclosed in Feist, polycarbonate is not disclosed as a possible optical layer material. (Feist, [0039]) Accordingly, claims 1-6, 11-14, 16-18, 20-21, 27-30, 42 and 44 have not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claims 1-6, 11-14, 16-21, 25, 27-31, 33, 35-38, 40-42 and 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Feist, Daecher, Hashizume and Ohgo, in view of Saito.

Claims 1-6, 11-14, 16-33, 35-38, 40-42 and 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Feist combined with Daecher, Hashizume and Ohgo, further in view of (Ueda or Ito) combined with Ogawa.

As discussed previously, none of Feist, Daecher, Hashizume, Ohgo, Saito, Ueda, Ito, or Ogawa, alone or combined, render obvious independent claims 1, 33, 38, 42 and 44 or their dependent claims as the references fail to teach or suggest a data storage medium comprising 1) a PAE/PAA substrate of a specified ratio in combination with a polycarbonate optical layer; and 2) the PAE/PAA substrate having the exacting dimensions for the land and groove features of the PAE/PAA substrate layer along with a high level of percent replication of mold features. Further, the references failed to provide some suggestion or incentive that would have motivated a skilled artisan to modify or combine the references to result in a data storage medium having the combination of a PAE/PAA substrate layer in combination with a polycarbonate optical layer. Accordingly, reconsideration and removal of the rejections is respectfully requested.



Double Patenting

Claims 1-6, 11-14, 16-33, 35-38, 40-42 and 44 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-32 of copending Application No. 10/648540 (US 2005/0046056) in view of Feist, Daecher and Ohgo. As neither case has been issued or allowed, and since the claims are therefore not final in either case, it is not possible to make any determination as to double patenting or obviousness at this time. Hence, withdrawal of this rejection at least until the present claims are allowed and the 10/648540 case has issued, is respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-1131.

Respectfully submitted,

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